

## CLAIMS

1. A device for the three-dimensional reconstruction of the flow conditions in a vascular system (3) with the aid of two-dimensional projections of the vascular system during a contrast-medium injection, comprising

- an imaging device (1) for producing two-dimensional projection pictures of the vascular system (3) taken from different directions (A, B<sub>i</sub>, C);
- an injection device (5) for the controlled injection of a contrast medium into the vascular system (3);
- a control unit (6) that is coupled to the imaging device (1) and that is designed to drive the imaging device in accordance with the following steps:

- a) production of projection pictures taken from the same projection direction (A) at a high picture-taking rate during the inflow of the contrast medium after a contrast-medium injection;
- b) rotation of the imaging device around the vascular system (3) and production of projection pictures taken from different directions (B<sub>i</sub>) while the vascular system (3) is filled with contrast medium.

2. A device as claimed in claim 1, characterized in that the imaging device is a rotation X-ray unit (1, 2, 4).

3. A device as claimed in claim 1, characterized in that, during the rotation of the rotation X-ray unit (1, 2, 4), the projection pictures are produced at a lower picture-taking rate and/or at a lower radiation dose.

4. A device as claimed in claim 1, characterized in that the control unit (6) is designed to drive the imaging device (1) after completion of the rotation to produce projection pictures taken from a fixed projection direction (C) at a preferably higher picture-taking rate.

5. A device as claimed in claim 1, characterized in that the control unit (6) is designed to initiate the beginning of the rotation as a function of an image analysis of the projection pictures produced during the inflow of the contrast medium.

5 6. A device as claimed in claim 1, characterized in that the control unit (6) is coupled to the injection device (5) in order to record and/or to control the injection process.

7. A method for the three-dimensional reconstruction of the flow conditions in a vascular system with the aid of two-dimensional projections of the vascular system during a contrast-medium injection, comprising the following steps:

- 10 a) production of projection pictures taken from the same projection direction (A) at a high picture-taking rate during the inflow of the contrast medium;
- b) production of projection pictures of the vascular system (3) taken from different directions ( $B_i$ ) while it is filled with contrast medium.

15 8. A method as claimed in claim 7, characterized in that the projection pictures are produced by means of X-rays.

9. A method as claimed in claim 8, characterized in that the picture-taking rate and/or the radiation dose is reduced during step b).

20 10. A method as claimed in claim 7, characterized in that, after step b), projection pictures are produced from a fixed direction (C) during the drainage of the contrast medium from the vascular system (3).